

8th 1-4

#1-6: name the property
commutative, associative, identity, or
zero

#7-14: Solve

#15-26: simplify- do as much math as
you can until you get stuck. you
might use the properties to do this

ex.) $2 + 9 + 3$ I will change the order

$$\begin{array}{c} 2 + 3 + 9 \\ \downarrow \\ \textcircled{5 + 9} \end{array}$$

ex.) $(3a)7$ I will change the order
again

$$\begin{array}{c} 3 \cdot 7 \cdot a \\ \downarrow \\ \textcircled{21a} \end{array}$$

1-4 Study Guide and Intervention

Properties

In algebra, there are certain statements called **properties** that are true for any numbers.

Property	Explanations	Example
Commutative Property of Addition	$a + b = b + a$	$6 + 3 = 3 + 6$ $9 = 9$
Commutative Property of Multiplication	$a \cdot b = b \cdot a$	$4 \cdot 5 = 5 \cdot 4$ $20 = 20$
Associative Property of Addition	$(a + b) + c = a + (b + c)$	$(3 + 4) + 7 = 3 + (4 + 7)$ $14 = 14$
Associative Property of Multiplication	$(a \cdot b) \cdot c = a \cdot (b \cdot c)$	$(2 \cdot 5) \cdot 8 = 2 \cdot (5 \cdot 8)$ $80 = 80$
Additive Identity	$a + 0 = 0 + a = a$	$10 + 0 = 0 + 10 = 10$
Multiplicative Identity	$a \cdot 1 = 1 \cdot a = a$	$5 \cdot 1 = 1 \cdot 5 = 5$
Multiplicative Property of Zero	$a \cdot 0 = 0 \cdot a = 0$	$15 \cdot 0 = 0 \cdot 15 = 0$

Example Simplify $3 \cdot (x \cdot 5)$.

$$\begin{aligned}
 3 \cdot (x \cdot 5) &= 3 \cdot (5 \cdot x) && \text{Commutative Property of Multiplication} \\
 &= (3 \cdot 5) \cdot x && \text{Associative Property of Multiplication} \\
 &= 15 \cdot x && \text{Multiply 3 and 5.}
 \end{aligned}$$

Exercises

Name the property shown by each statement.

1. $75 + 25 = 25 + 75$

2. $2 \cdot (3 \cdot 4) = (2 \cdot 3) \cdot 4$

3. $14 \cdot 1 = 14$

4. $p \cdot 0 = 0$

5. $6 + (5 + m) = (6 + 5) + m$

6. $2(6) = 6(2)$

Simplify each expression.

7. $24 + (x + 6)$

8. $3 \cdot (4a)$

9. $9 + (12 + c)$

10. $13d \cdot 0$